Project 1 – Graphing Linear Equations

1. Define the following terms:

Crime =

Incarceration =

Crime Rate =

Incarceration Rate =

2. Make a Prediction: Do you think there is a relationship between crime and incarceration? If so, describe the relationship. If not, explain why not.

|  |  |
| --- | --- |
| Year (x) | Total Incarcerations (y) |
| 1990 | 297 |
| 1995 | 411 |
| 2000 | 469 |

3. Make 2 observations about the following data:

|  |  |
| --- | --- |
| Year (x) | Total Crimes (y) |
| 1990 | 5803 |
| 1995 | 5275 |
| 2000 | 4125 |

4. Using the data provided in the table above, write the equation of the line in slope-intercept form that represents total incarcerations.

For the year 1990, let x = 0. For the year 1995, let x = 2. For the year 200, let x = 10.

5. Using the data provided in the table above, write the equation of the line in slope-intercept form that represents total crimes.

6. What does the slope of each line represent in real life? What does this say about incarceration and crime?

7. What is the y-intercept of each line? What does the y-intercept represent for the data?

8. Find the x-intercept of each line. What does the x-intercept represent for the data?

9. Using the equations that you write in Questions 4 and 5, predict the crime rate and incarceration rate in the years 2005, 2010, and 2030.

10. Graph both equations on one coordinate plane. Clearly label each line. Identify the solution to the system of equations. What does this solution represent?

11. Look back at your prediction from Question 2. Does your prediction make sense? Why or why not?

12. Write three sentences about the relationship between crime and incarceration rates and why you think the relationship is this way.